

Simulating Toxic Effects in an Ocean Ecosystem

Pesticides are one group of compounds that may harm many different organisms. The negative impact of an accidental spill of pesticides can be felt in ocean ecosystems. In this activity you will simulate these effects.

Materials

- Coloured “food source”
- Organism name tags
- Small bags or containers

What to do

1. You will be assigned a role in an ocean ecosystem as a killer whale, seal, big fish, small fish or krill. Determine your role in the food chain, and do not show anyone your card.
2. Count your “food source”, record the number for each colour in the table 1.
3. Your teacher will time a “feeding” period and you will simulate food gathering by playing rock paper scissors and comparing your card with your classmates. The person with a predator card will be able to take the prey’s food source. The eaten prey must stay where they are as they are now dead.
4. When the simulation is over, the surviving organisms needs to count the number of coloured food source and record it in the table 1.
5. Your teacher will tell you which colours represent food contaminated by pesticides. Determine the percentage of toxic food source “eaten” by your organism using the formula below.

“Toxic colour food”

Total food x 100

6. If there are any krill still alive who consumed any toxic colours, they are now dead. If there are any small fish still alive that consumed 20% or more toxic colours, they are now dead. If any higher carnivores consumed 20% or more toxic colours, they are now sick. If they consumed 30% or more, they are now dead.
7. Determine how many organisms are still alive and answer the following questions under what did you find out. Return all materials back to your teacher.

Table 1. Number of coloured food source before and after simulation.

Colours →						Total
Before						
After						

% of toxic food consumed: _____ percent

My organism is _____ (alive, sick or dead)

[Type text]

Table 2. Survival and mortality rate of marine organisms.

	Alive	Alive and Sick	Dead	Total
Killer whale				
Seal				
Big fish				
Small fish				
Krill				

What did you find out?

1. What effect did the pesticide have on the ecosystem?

2. What effect would a pesticide have on an ecosystem if it remained in the ecosystem for 50 years instead of degrading rapidly?

3. Answer questions #3-13 on p.103 on a separate sheet of paper.